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many of which are barbed. While barbed points are rarely used in the bison area, there was a strong tendency to use bone points, especially in the north.

In addition to the preceding, the investigation is concerned with such traits as textile arts, birchbark technique, weapons, and special manufacturing processes. The distribution of the traits enumerated above indicates a fundamental similarity between the material cultures of the caribou and bison areas. The interpretation of this observation is an important theoretical problem. The experience of anthropologists to date is that in all such cases we have two major alternatives, diffusion from a single center or independent development in two or more localities. It remains to be seen which of these will be the more satisfactory interpretation for the above noted similarities in culture.

Finally, this study has developed the problem of caribou, or New World reindeer, culture in its relation to the reindeer culture of the Old World in both modern and paleolithic times. It now appears probable that in the great area of the reindeer and caribou (for they are geographically continuous) we have a concomitant human culture which may be as old as paleolithic man in Europe. This will be more fully discussed when our detailed studies of caribou culture are published.

REPORT ON THE AUTUMN MEETING

Prepared by the Home Secretary

The Autumn Meeting of the National Academy of Sciences was held in the Botanical Laboratory of the University of Chicago on December 7, 8, and 9, 1914, twenty-one members of the Academy being present.

BUSINESS SESSIONS

Business sessions were held on December 8 and 9, at which the following business was transacted:

The President announced that since its Annual Meeting in April the Academy had lost by death two members, Theodore Nicholas Gill, elected in 1873, who died on September 25, 1914, and Charles Sedgwick Minot, elected in 1897, who died on November 19, 1914; also two foreign associates, Edouard Suess, elected in 1898, who died on April 26, 1914, and August Weismann, elected in 1913, who died on November 5, 1914.

The President made also the following announcements:

That Mr. Ira Remsen was acting as Chairman of the Board of Directors of the Bache Fund for the time being in the place of Charles S. Minot, deceased.

That by the death of Theodore N. Gill a vacancy was created in the Finance

Committee, and that this had been filled by the appointment of Mr. Arnold Hague.

That the following standing committees of the Academy had been chosen by the Council in accordance with article 4, section 4, of the Constitution:

COMMITTEE ON NOMINATIONS

CHITTENDEN, R. H.	NOYES, A. A. (Chairman)	TRELEASE, WILLIAM
COMSTOCK, G. C.	HAGUE, ARNOLD	WOODWARD, R. S.
CONKLIN, E. G.	HOLMES, W. H.	
	MOORE, E. H.	

COMMITTEE ON MATHEMATICS

BOCHER, MAXIME	MOORE, E. H. (Chairman)	VAN VLECK, E. B.
BOLZA, OSKAR	MOULTON, F. R.	WEBSTER, A. G.
DICKSON, L. E.	OSGOOD, W. F.	WOODWARD, R. S.

COMMITTEE ON ASTRONOMY

BARNARD, E. E.	COMSTOCK, G. C. (Chairman)	MOULTON, F. R.
CAMPBELL, W. W.	FROST, E. B.	PICKERING, E. C.
ELKIN, W. L.	HALE, G. E.	WOODWARD, R. S.

The President also announced that he had appointed the following committees:

COMMITTEE ON THE PROGRAM FOR THE MEETINGS

CATTELL, J. MCK.	BOLTWOOD, B. B. (Chairman)	FROST, E. B.
	MALL, F. P.	

AUDITING COMMITTEE

CLARKE, F. W.	DALL, W. H. (Chairman)	DAY, A. L.
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COMMITTEE ON THE REVISION OF THE CONSTITUTIONAL RULES

DAY, A. L.	CROSS, WHITMAN (Chairman)	WALCOTT, C. D.
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The President further announced that committees on trust funds had been reappointed in accordance with Rule 27 as follows, the numbers following the names showing the date at which the term of service expires.

THE HENRY DRAPER FUND

WRIGHT, A. W., 1915	HALE, G. E. (Chairman), 1918	CAMPBELL, W. W., 1919
	TROWBRIDGE, JOHN, 1916	

MICHELSON, A. A., 1917

THE J. LAWRENCE SMITH FUND

PUMPELLY, R., 1915	MORLEY, E. W. (Chairman), 1919	DANA, E. S., 1918
	REMSEN, IRA, 1916	

HAGUE, ARNOLD, 1917

THE COMSTOCK FUND

THOMSON, ELIHU, 1915	NICHOLS, E. L. (Chairman), 1918	NOYES, A. A., 1919
	CREW, HENRY, 1916	
	WEBSTER, A. G., 1917	

THE MURRAY FUND

DALL, W. H., 1915	HAGUE, ARNOLD, 1916	PARKER, G. H., 191
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The Committee on the Amendment to the Act of Incorporation of the Academy reported through Mr. Charles D. Walcott, its Chairman, that the following amendment had been passed by both houses of Congress during the last session and approved by the President on May 27, 1914:

(Public—No. 109—63d Congress. S. 4096)

An Act to amend the Act authorizing the National Academy of Sciences to receive and hold trust funds for the promotion of science, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act to authorize the National Academy of Sciences to receive and hold trust funds for the promotion of science, and for other purposes, approved June twentieth, eighteen hundred and eighty-four, be, and the same is hereby, amended to read as follows:

“That the National Academy of Sciences, incorporated by the Act of Congress approved March third, eighteen hundred and sixty-three, be, and the same is hereby, authorized and empowered to receive, by devise, bequest, donation or otherwise, either real or personal property, and to hold the same absolutely or in trust, and to invest, reinvest, and manage the same in accordance with the provisions of its constitution, and to apply said property and the income arising therefrom to the objects of its creation and according to the instructions of the donors: Provided, however, That the Congress may at any time limit the amount of real estate which may be acquired and the length of time the same may be held by said National Academy of Sciences.”

Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.
Approved, May 27, 1914.

At the business session on December 8, 1914 the Committee on the Revision of the Constitution and Rules reported a series of amendments to the constitution of the Academy, which, after discussion, were referred to the Council for consideration and report. The Council presented its report, with further amendments, to the Academy at the stated session on December 9, 1914; and the amended report was adopted by the Academy, sitting as a committee of the whole. This report will come up for final consideration by the Academy at the stated meeting in April 1915.

A new Rule was adopted, reading as follows: The holders of the Medal for Eminence in the Application of Science to the Public Welfare shall be notified, like members, of the meetings of the Academy, and invited to participate in its scientific sessions.

Rule III was amended, by replacing the second and third sentences, so as to read as follows: That it shall be the duty of the Auditing Committee to verify the records, receipts, and disbursements maintained by the Treasurer and the agreement of book and bank balances; to examine all securities in

the custody of the Treasurer, and to compare the stated income of such securities with the receipts of record; to examine all vouchers covering disbursements for the account of the Academy and the authority therefor, and to compare them with the Treasurer's record for expenditures; to examine and verify the account of the Academy. The auditing committee may employ the services of an expert accountant to assist in the examination of the books of the Treasurer.

The recommendation of the Committee on the Henry Draper Fund to award the Draper medal in 1915 to Prof. Joel Stebbins, of the University of Illinois, in recognition of his work on Application of the Selenium Cell to Stellar Photometry, was approved.

A resolution of the Council providing for a special business meeting and a special scientific meeting of the Academy on April 19, 1915, to be followed by the stated meeting on Tuesday and Wednesday, April 20 and 21, 1914, as required by the constitution, was unanimously adopted.

It was voted that the thanks of the National Academy of Sciences be given to the Chairman, Mr. E. H. Moore, and to the members of the local committee for their most successful arrangements for the Autumn Meeting held in Chicago, December 7, 8, 9, 1914.

It was further voted that the thanks of the Academy be extended to President Judson, to the University of Chicago, to the Quadrangle Club and to the Chaos Club for their aid in arranging the social features which contributed so much to the enjoyment of the Autumn Meeting.

SCIENTIFIC SESSIONS

Two public lectures on the WILLIAM ELLERY HALE FOUNDATION were given on December 7 and 8 by WILLIAM WALLACE CAMPBELL, Director of the Lick Observatory, on Stellar Evolution and the Formation of the Earth.

Four public scientific sessions were held on December 7, 8, and 9, at which the following papers were presented:

1. W. W. CAMPBELL: On the radial velocities of nebulae.
2. HEBER D. CURTIS (introduced by W. W. Campbell): Preliminary note on nebular proper motions.
3. R. A. MILLIKAN (introduced by A. A. Michelson): The coefficient of slip in gases and its relation to the nature of the impact between a molecule of a gas and the surface of a solid or liquid.
4. W. D. HARKINS and E. C. HUMPHREY (introduced by Julius Stieglitz): The capillary and electrical forces at the interface between two liquids.
5. HERBERT N. MCCOY (introduced by Julius Stieglitz): The solubilities of radium compounds as indicated by the solubilities of analogous compounds of calcium, strontium, and barium.
6. L. A. BAUER (introduced by George E. Hale): Present status of the general magnetic survey of the globe.
7. CHARLES J. CHAMBERLAIN (introduced by J. M. Coulter): A phylogenetic study of cycads.
8. C. M. CHILD (introduced by J. M. Coulter): A dynamic conception of the organic individual.

9. S. W. WILLISTON (introduced by T. C. Chamberlin): The American land vertebrate fauna and its relations.
10. A. J. CARLSON (introduced by J. M. Coulter): Some new observations on the physiology of the stomach in man.
11. LEONARD E. DICKSON: Recent progress in the theories of modular and formal invariants.
12. HENRY S. WHITE (introduced by L. E. Dickson): The synthesis of triad systems Δ_t in t elements, in particular for $t = 31$.
13. E. J. WILCZYNSKI (introduced by E. H. Moore): Conjugate systems of space curves with equal Laplace-Darboux invariants.
14. EDWIN B. FROST: An interesting stellar system.
15. GEORGE E. HALE: The direction of rotation of solar storms.
16. A. A. MICHELSON: Behavior of metals and other substances near the rupture point.
17. C. W. BALKE and GEORGE W. SEARS (introduced by W. A. Noyes): The atomic weight of tantalum.
18. E. W. WASHBURN (introduced by W. A. Noyes): Our systematic knowledge of the properties and behavior of solutions of non-electrolytes.
19. T. C. CHAMBERLIN: The fundamental segmentation of the earth.
20. WILLIAM TRELEASE: Phoradendron.
21. CHARLES E. ALLEN (introduced by E. B. Van Vleck): Development of the male germ cells of polytrichum.
22. C. T. KNIPP (introduced by W. A. Noyes): Experimental data on the stability of positive and negative ions.
23. S. W. PARR (introduced by W. A. Noyes): The development of an acid-resisting alloy for a bomb calorimeter.
24. W. L. TOWER (introduced by J. M. Coulter): Experimental production of a new ordinal character.
25. G. A. MILLER (introduced by L. E. Dickson): The ϕ -subgroup of a group of finite order.
26. E. E. BARNARD: Explanation of certain phenomena of the tail of comet Morehouse (III, 1908).
27. PHILIP FOX (introduced by E. B. Frost): The rotation-period of the sun.
28. J. C. KAPTEYN and W. S. ADAMS: On the relations between the proper motions and the radial velocities of the stars of the spectral types F, G, K, and M.
29. S. B. NICHOLSON (introduced by W. W. Campbell and A. O. Leuschner): Discovery of a ninth satellite of Jupiter.
30. FRANK R. LILLIE (introduced by J. M. Coulter): The fertilizing power of sperm dilutions.
31. GILBERT AMES BLISS (introduced by E. H. Moore): A generalization of a theorem of Gauss concerning geodesic triangles.
32. F. R. MOULTON: An extension of the process of successive approximations for the solution of differential equations.
33. JULIUS STIEGLITZ: Molecular rearrangements of triphenylmethyl derivatives.
34. WILLIAM CROCKER and J. F. GROVES (introduced by J. M. Coulter): Methods of determining the life-duration of seeds.
35. EDWIN O. JORDAN (introduced by J. M. Coulter): Variation in bacteria.
36. SHIRO TASHIRO (introduced by J. M. Coulter): On the nature of nerve impulse.
37. ELIAKIM H. MOORE: On the integration by successive approximations of the ordinary differential equation of the first order in general analysis.
38. W. H. WRIGHT (introduced by W. W. Campbell): On the occurrence of the line 4886A and the related series of lines in the spectra of the planetary nebulae.